(12) UK Patent Application (19) GB (11) 2 058 850 A

(21) Application No **7933192**
(22) Date of filing **25 Sep 1979**
(43) Application published
15 Apr 1981
(51) **INT CL³**
D01H 5/80
(52) Domestic classification
D1D HE
F2U 20B1 21A
(56) Documents cited
GB 1492497
GB 1133354
GB 830324
GB 824070
GB 374803
GB 304098
(58) Field of search
D1D
F2U
(71) Applicants
Tashkentskoe Spetsiainoe Konstruktorskoe Bjuro Textilnykh Mashin, ulitsa Sh. Rustaveli, 53-b, Tashkent, Union of Soviet Socialist Republics
(72) Inventors
Gennady Nikolaevich Shlykov,
Vitaly Ivanovich Zhestkov,
Valentin Nikitovich Tikhonov,
Vasily Mitrofanovich Dyachkov,
Alexandr Kuzmich Kudelin
(74) Agents
Marks & Clerk, 57—60 Lincoln's Inn Fields, London WC2A 3LS

(54) **Pressure roll for a drafting device for a textile machine**

(57) A pressure roll (10) of a drafting device comprises a cylindrical casing (7), and a sleeve (8) of an elastic material having flanges. The sleeve is mounted in a spaced relationship around the casing, the flanges of the sleeve are bent toward one another and each flange has two portions of which one portion (12) extends at an angle to the generatrix of the cylindrical casing and the other portion (13) extends in parallel with the generatrix and is secured to the cylindrical casing so that a satisfactory elasticity of the roll along the entire length of the working surface is ensured.

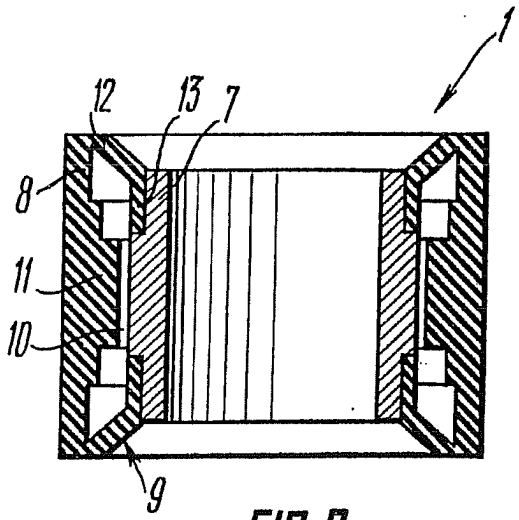

FIG. 2

GB 2 058 850 A

2058850

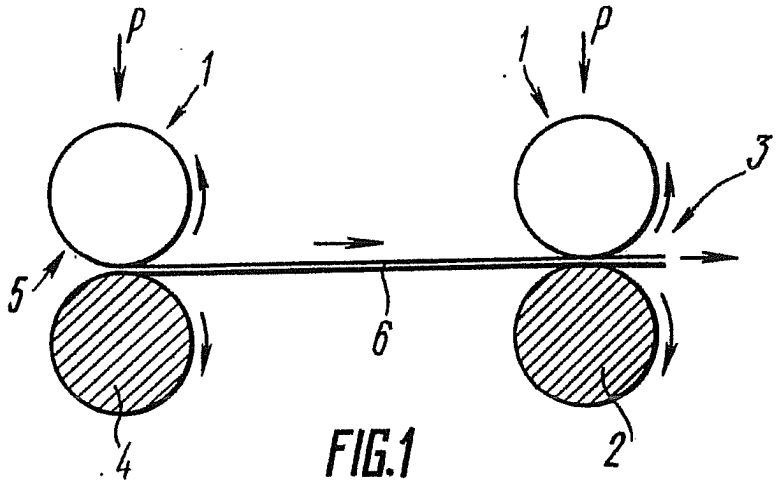

FIG.1

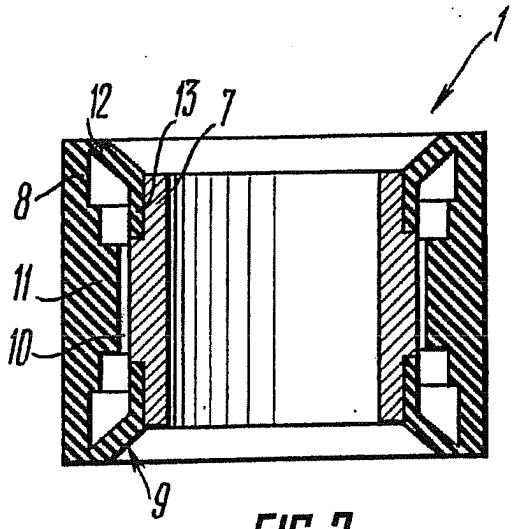

FIG. 2

2058850

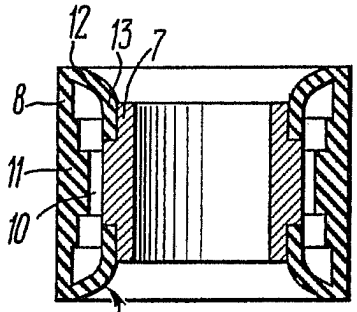

FIG. 3

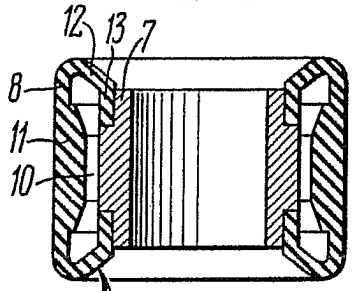

FIG. 4

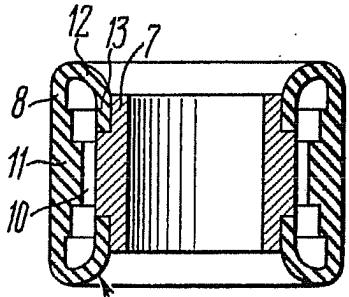

FIG. 5

2058850

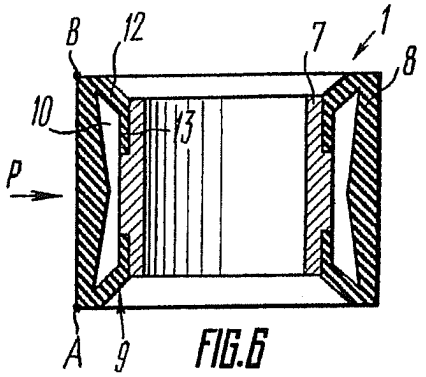

FIG.6

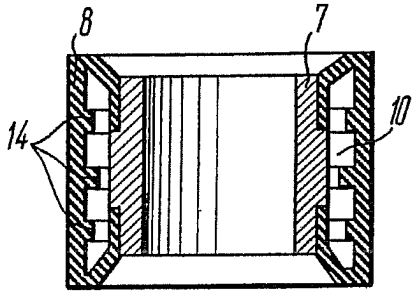

FIG.7

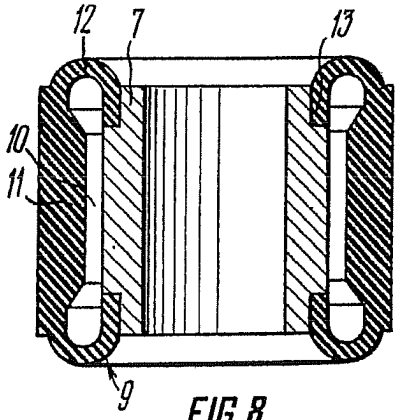

FIG.8

SPECIFICATION

Pressure roll for a drafting device for a textile machine

The invention relates to a pressure roll for a drafting device to be used in textile machines.

The invention may be most advantageously used in spinning machines.

One of the main functions of a drafting device is to effect the drafting which, first, makes a product thinner owing to shear of fibres, and secondly, straightens the fibres and arranges them in parallel fashion.

The object of the drafting process mainly resides in thinning of a fibrous material.

According to the invention, there is provided a pressure roll for a drafting device, comprising a cylindrical casing supporting a sleeve of an elastic material mounted in a spaced relationship around the outside of the casing and secured thereto by flanges to define an enclosed annular space between the casing and sleeve, the sleeve being internally enlarged in the middle portion thereof, wherein, the flanges of the sleeve are bent toward one another with the formation of at least two portions in each flange of which the first portion extends at an angle to the generatrix of the casing and partially projects axially beyond the casing and the second portion extends parallel with the generatrix between the extremity of the casing and the middle portion thereof and is designed for fastening the elastic sleeve to the casing.

This construction of the pressure roll ensures uniform rigidity thereof in the pinching zone of the pressure roll and cylinder in both feeding and outlet pairs of rolls along the generatrix owing to the fact that a portion of the flange extends at an angle to the roll axis, whereby the rigidity at the extremities of the roll becomes equal to the roll rigidity in the middle portion thereof. Uniform distribution of fields of friction forces in the fibrous material being handled is thereby enhanced and uniformity of discharge of the fibrous material is improved.

The areas where the inclined and parallel portions of the flange meet are preferably arcuate.

The areas where the elastic sleeve and the flange meet are preferably arcuate.

The radius of arc between the inclined portion and the sleeve and between the inclined and parallel portions of the flanges are preferably equal to each other.

The ratio of the thickness of the inclined portion of the flange to that of the enlarged middle portion of the sleeve is preferably from 1:2 to 1:5.

The inner surface of the sleeve may comprise two frustoconical surfaces with their greater bases facing the flanges so that the sleeve is enlarged in the middle portion thereof.

The elastic sleeve of the pressure roll may be step-shaped with the thickness increasing to the middle portion.

The elastic sleeve may be provided with inner annular projections, the thickness of the projections increasing from the ends toward the middle portion.

The inclined portions protruding from the casing may also be arcuate.

The invention will now be described, by way of example, with reference to specific embodiments illustrated in the accompanying drawings, in which:

Figure 1 schematically shows a drafting device; and

Figures 2 to 8 show, in cross-section, alternative forms of pressure rolls according to the invention.

Before detailed discussion of the pressure rolls shown, it should be noted that they are suitable both for use in a conventional drafting device, such as that shown and disclosed in USSR Inventor's Certificate No. 364,696, including a feeding pair of rolls and an outlet pair of rolls, each pair comprising a pressure roll, and for separating open-end spinning devices.

A conventional drafting device is schematically shown in Figure 1, where pressure rolls according to the invention are shown at 1. One pressure roll is pressed against a lower cylinder 2 of an outlet pair of rolls 3, and the other pressure roll is urged against a lower cylinder 4 of a feeding pair of rolls 5, and a fibrous material 6 is made to pass therebetween.

The pressure roll shown in Figure 2 comprises a cylindrical casing 7 rigidly fixed to a rotary axle (not shown). The casing 7 supports a sleeve 8 made of an elastic material. The sleeve 8 is mounted on the casing 7 by means of flanges 9 and is in a spaced relationship to the casing 7 to define an annular space between the casing 7 and the sleeve 8. The sleeve has inner enlarged portions 11 in the middle portion thereof.

The flanges 9 of the sleeve 8 have two portions of which one portion 12 extends at an angle to the generatrix of the cylindrical casing 7 and the other portion 13 extends parallel with the generatrix and is designed to be fastened to the casing 7.

Figures 3, 4 and 5 show embodiments of the pressure roll which are basically similar to that of Figure 2, and similar elements are indicated by the same reference numerals.

In Figure 3, the inclined portion 12 and the parallel portion 13 of the flange 9 are joined by an arcuate portion.

In Figure 4 the elastic sleeve 8 is joined to the inclined portion 12 of the flange 9 by an arcuate portion.

In Figure 5 the radius of arc where the inclined portion 12 is joined to the sleeve 8 and the radius of arc where the inclined portion 12 is joined to the parallel portion 13 of the flange 9 are equal to each other.

Figure 6 shows another embodiment of the pressure roll which is mainly similar to those described above, and the same elements are shown by the same reference numerals. In Figure 6, the inner surface of the sleeve, as can be best seen in the drawing, comprises two truncated cones with their greater bases facing the flanges and their smaller bases facing one another. The

thickness of the sleeve thereby increases uniformly from the sleeve ends to the middle thereof.

Figure 7 shows still another embodiment of the invention, wherein the enlarged portions internally of the sleeve are in the form of annular projections 14. The height of the projection at the middle portion of the sleeve is greater than that of the projections nearer the ends of the sleeve.

In Figure 8, the centre of arc where the inclined portion 12 is connected to the sleeve 8 coincides with the centre of arc where the inclined portion 12 is connected to parallel portion 13 of the flange.

The pressure roll functions in the following manner.

The fibrous material 6 is made to pass between the feeding pair of rolls and the outlet pair of rolls, the linear velocity of the outlet pair of rolls being greater than the linear velocity of the feeding pair of rolls.

Each pair of rolls has a pressure roll 1 in frictional engagement with a lower cylinder rotated by a drive (not shown).

The pressure roll 1 rotating on an axle presses the fibrous material 6 against the cylinder so that the elastic sleeve deforms. The provision of the enlarged portion 11 of the sleeve 8, and the flange 9 having one portion 12 extending at an angle to the generatrix of the cylindrical casing ensures uniform pressure of the pressure roll 1 against the cylinder over the entire cross-section of the fibrous material.

To increase the elasticity of the sleeve by reducing the rigidity of the flanges 9, the ratio of the flange thickness to the sleeve thickness at the middle portion thereof may be from 1:2 to 1:5.

The provision in the flanges 9 of two portions 12 and 13, of which one portion extends at an angle to the generatrix of the roll, makes it possible to use these portions as a kind of fulcrum for supporting the sleeve 8 on the cylindrical casing 7 so that upon engagement of the pressure roll 1 with a cylinder 2, 4 and application of a load "P", the extremities "A" and "B" (Figure 6) of the sleeve 8 are caused to displace from the middle portion thereof toward the flanges 9 while rotating along an arc about a point which is in the zone of conjugation of the inclined portion 12 and the portion 13 at which the flange is secured to the casing.

As a result of displacement of the points "A" and "B" in opposite directions, the sleeve 8 is slightly stretched along the generatrix of the roll 1 thereby resulting in a certain increase in the rigidity of the sleeve and equalization of the roll elasticity over the entire length thereof tranversely of the flow of the fibrous material.

In all the above-described rolls it is preferred that the straight portion 13 of the flange be cemented or otherwise strongly connected to the casing 7 to ensure a tight sealing of the enclosed annular space. An elastic medium in the interior of the roll which is thus formed functions as a damper for the oscillating working surface of the roll vibrating upon the passage of thicker or thinner portions of the fibrous material. This facility enables the maintenance of uniformly distributed fields of friction forces during the entire operating cycle of the drafting device.

The use of the pressure rolls described enables a substantial improvement in the uniformity of fibrous material designed for high-speed spinning.

CLAIMS

1. A pressure roll for a drafting device for a textile machine, the roll comprising a cylindrical casing supporting a sleeve of an elastic material mounted in a spaced relationship around the outside of the casing and secured thereto by means of flanges to define an enclosed annular space between the casing and sleeve, the sleeve being internally enlarged in the middle portion thereof, the flanges of the sleeve extending towards one another and each flange having at least two portions of which one portion extends at an angle to the generatrix of the cylindrical casing and partially projects axially beyond the casing and the other portion extends parallel with the generatrix between the extremity of the cylindrical casing and the middle portion thereof and is designed for fastening the elastic sleeve to the cylindrical casing.

2. A pressure roll as claimed in claim 1, wherein the zones of conjugation of the inclined portion and parallel portion of the flange are arcuate.

3. A pressure roll as claimed in claim 1 or claim 2, wherein the zones of coupling of the elastic sleeve to the flange are arcuate.

4. A pressure roll as claimed in any one of claims 1 to 3, wherein the radius of arc in the zones of coupling of the inclined portion to the sleeve and the radius of arc in the zones of conjugation of the inclined and parallel portions of the flange are equal to each other.

5. A pressure roll as claimed in any one of claims 1 to 4, wherein the inner surface of the sleeve comprises two frustoconical surfaces with their greater bases on the side of the flanges so that the thickness of the elastic sleeve gradually increases towards the middle portion thereof, the angle of inclination of the cone generatrix being substantially smaller than the angle of inclination of the first portion of the flange to the cylindrical casing.

6. A roll as claimed in any one of claims 1 to 4, wherein the inner surface of the sleeve is step-shaped lengthwise.

7. A roll as claimed in any one of claims 1 to 4, wherein the inner surface of the sleeve is provided with annular projections of a height increasing from the ends to the middle portion.

8. A roll as claimed in any one of the foregoing claims, wherein the thickness of the inclined portion of the flange is from 1:2 to 1:5 of the thickness of the enlarged portion in the middle portion.

9. A roll as claimed in any one of the foregoing claims, wherein the portion secured to the casing

is cemented to the casing so as to ensure a tight sealing of the inner space.

10. A pressure roll for a drafting device for a textile machine substantially as hereinbefore described with reference to, and as shown in any one of Figures 2 to 8 of the accompanying drawings.

11. A drafting device for a textile machine, including a pressure roll as claimed in any one of the foregoing claims.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1981. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.